NOAA Science Advisory Board: Themes for Dealing with NOAA Science Reviews

The National Oceanic and Atmospheric Administration (NOAA) is a mission-oriented agency. It is responsible for monitoring, understanding, and predicting changes in the Earth's environment as part of its Environmental Assessment and Prediction Mission and for managing coastal and marine resources as part of its Environmental Stewardship Mission. NOAA has an obligation to provide good scientific information to policy makers and it also has an obligation for operational implementation of its science results. *The NOAA Science Advisory Board believes that successful research and development programs have certain characteristics, or themes.*

At its July 1999 meeting in Seattle, the NOAA Science Advisory Board (SAB) passed a motion to adopt eight overarching themes that should be woven into all aspects of NOAA science and considered in SAB reviews of NOAA science. These principles include: 1) quality, creativity, and credibility; 2) timeliness, scale and scope; 3) science connected to the formulation, application and operational implementation of policy; 4) capacity building; 5) education; 6) efficiency; 7) social science integration; and 8) diversity. The intent is to ensure these eight themes are considered to a sufficient degree when NOAA science activities are planned, developed, implemented, and reviewed. These themes should be espoused and supported by NOAA leadership and form the basis of any SAB review of NOAA science. *However, these themes should not be viewed as necessary or sufficient criteria for the science review of any individual program.*

The Board believes that the following themes are important parameters to consider relative to the review of NOAA science projects and programs. The themes are not listed in order of priority and the programs mentioned are not intended to be exclusive of other NOAA programs and activities.

- **Quality, Creativity, and Credibility:** NOAA science must be top quality. In general, NOAA is known for and should continue to strive for science that is acknowledged as being credible, reliable and respected. Therefore, NOAA science needs to be screened and evaluated through appropriate peer review as being of high quality. Appropriate client groups should also express satisfaction that NOAA Science is relevant in terms of informing policy decision-making.

- **Timeliness, Scale and Scope:** NOAA science should be timely in the sense that it will be conducted and completed in a timeframe that is useful to decision-makers. It must also be at a scale and scope that is useful.

- **Science Connected to the Formulation, Application and Operational Implementation of Policy:** NOAA science should be directly linked to the information required for policy-setting and decision-making. NOAA science should be designed and conducted with the understanding it is intended to inform and improve decision-making relative to coastal and ocean stewardship responsibilities, and policy formulation in weather, climate, and hydrology.

- **Capacity-Building:** NOAA has multiple environmental monitoring and stewardship responsibilities which collectively provide the foundation and constitute the Nation's ability to assess and address environmental issues. Among these is to assist its partners (including state and local governments, universities, private firms, non-profits, international affiliates, etc.) to build capacity to address scientific and technical questions related to atmospheric, oceanic, coastal and hydrologic prediction and assessment efforts. Reviews should address how NOAA science contributes to meeting these responsibilities.

- **Education:** Working collaboratively with partners, stakeholders, and citizens to protect and restore our environment for the benefit of current and future generations requires far-reaching public education initiatives, public support and public involvement. NOAA also needs to inform the environmental scientists and practitioners of the future. Therefore, an educational and public outreach component of NOAA science should be encouraged.

- **Efficiency:** NOAA must effectively coordinate and integrate its scientific and technical capabilities to maximize efficiency, minimize redundancy and counter-productive overlap. Unnecessary programs or program elements must be eliminated. There needs to be a greater effort to share expertise within different sectors of NOAA, and all sources of complementary external science capability.

- **Social Science Integration:** There are important human dimensions to the use of environmental predictions (weather and climate forecasting) and to management of the Nation's coastal and ocean resources. Understanding complex environmental systems requires the integration of the social and economic sciences with the biological and physical sciences. Successful integration begins in problem formulation and is present through science activities to the end of the research pipeline.

- **Diversity:** There is a need to expand involvement of people not historically involved or represented in NOAA science programs. NOAA should take explicit and tangible steps to achieve greater diversity in its science programs, projects, and activities. NOAA systems, policies and practices should encourage diversity and support all employees as they work to reach organizational and professional goals.